

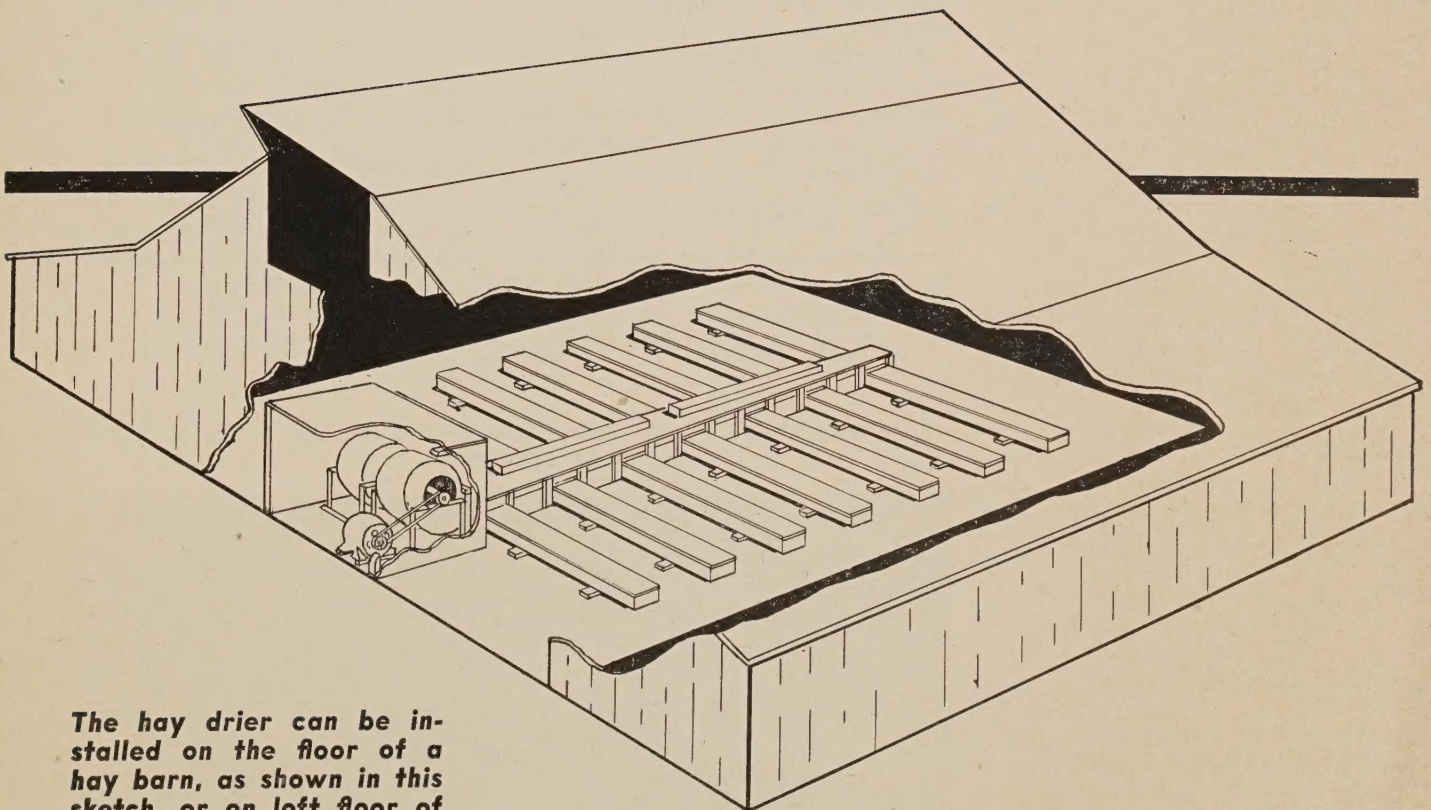
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Build **A HAY-DRIER FOR YOUR BARN**

- For Better Hay
- To Save Haying Costs
- To Prevent Weather Losses
- To Increase Mow Capacity



The hay drier can be installed on the floor of a hay barn, as shown in this sketch, or on loft floor of dairy barn.

HAYING time doesn't have to be worry time. You needn't fear that rain or damp weather will ruin your hay crop.

You can build and install an electrically-powered hay-drying apparatus in your hay barn or dairy barn with only a few days' work. Then you will not need to dry your hay completely before storing it. You can load it in the barn while it still retains nearly half its original moisture, and finish the drying by forcing air through it under motor-driven pressure by means of a series of ducts.

In this way you not only will be able to laugh at Old Man Bad Weather during haying season, but you will have better hay.

Tests have shown clearly that barn-dried hay grades higher than field-dried hay. Leaves, green color and palatability of the hay are retained; the sun bleaches hay and causes leaves to drop after cutting; food values dwindle when leaves are lost. Barn-cured hay looks fresh long after it is thoroughly dry. More than that, it tastes fresh to cattle, so is more palatable.

How to Prepare Hay for Barn Drying

Cutting of hay for barn curing takes advantage of the fact that hay dries very rapidly after it is mowed. Hay should be cut in the morning just after the dew is off, and allowed to stand four hours or so in the swath, then raked into windrows and dried for another two or three hours. Moisture content will be reduced to about 45% by this time, depending upon weather conditions.

At this stage, hay may be taken to the barn and placed on the drying ducts, where drying continues until moisture content is about 12%. It will then keep safely.

Drying the Hay

Uncured hay must be evenly distributed and uniformly packed on the air ducts, at a depth of not less than four or more than eight feet for one curing. After a layer has been dried, another may be placed on top of the dried hay, but total depth should not exceed 20 to 25 feet.

When humidity is such that the air will absorb moisture from the hay, keep the fan in the drier running continuously. At night and on rainy days the fan is used only to prevent heating—for about one hour at 6-hour intervals, because the hay will absorb mois-



Main duct before laterals are built.



Laterals must fit snugly at ducts.

Things to remember

ture from damp air. Hay can thus be dried in 10 to 14 days to the proper moisture content.

Better Hay Means Better Milk

Drying hay in the barn produces an efficient low-cost feeding ration requiring less concentrates to maintain milk flow, gain and health. Also, indirect gains are made through higher levels of milk production over longer lactation periods; better physical condition of the cows, and improved color and vitamin potency of the milk—in other words, the usual results obtained from use of grass silage.

What Is a Hay Drier?

Basically, the drier consists of a large main duct and a lateral system of small ducts at right angles to the main duct, placed flat on the floor of the hay

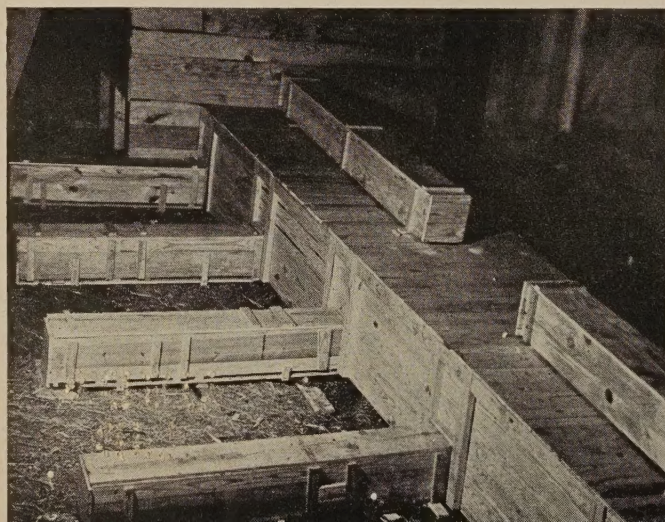
barn or on the loft floor. A fan or fans pulls air through louvres in barn wall (see photograph on page 11) and pushes it through the main duct into the lateral ducts. The fans are powered by a motor of 2 to 5-horsepower size, depending on the amount of air required. The air under pressure escapes from openings below the smaller ducts, which are raised from the floor by cleats or similar arrangement, and is forced up into the hay, removing heat and drying the hay as it works through and escapes above hay.

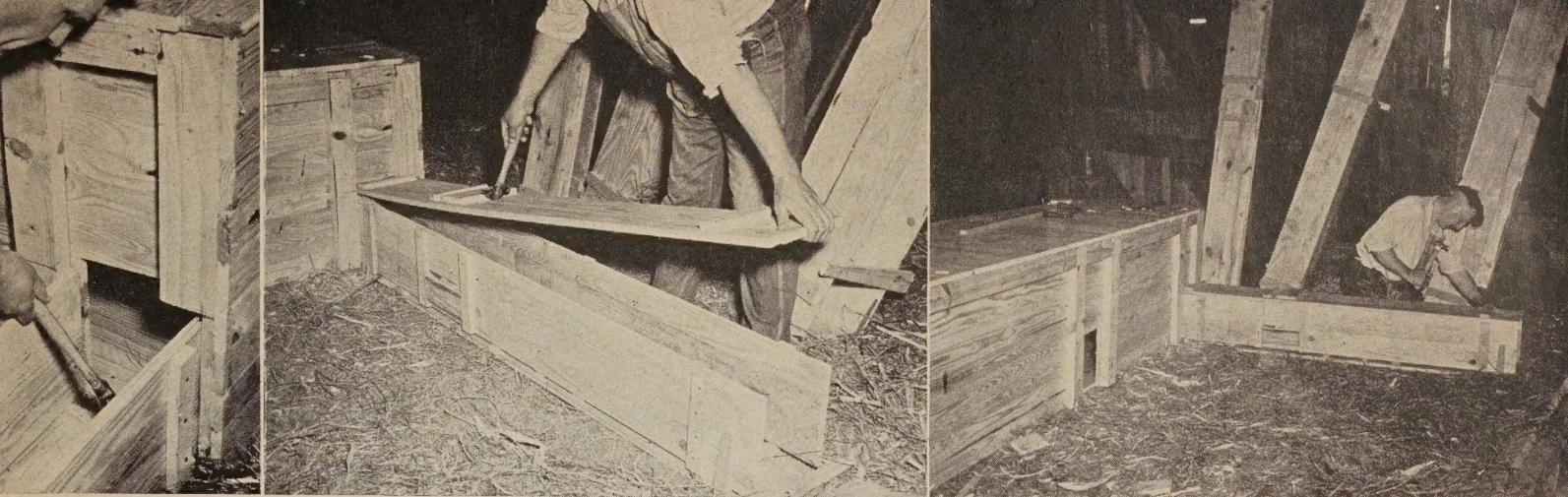
Location

The drier can be built either on a loft floor or in a hay barn. If floor of loft or barn is of airtight construction, such as tongue-and-groove, it can serve as bottom of ducts. If floor is not airtight, it should be covered with insu-

Note escape ducts on top of main duct, to prevent heating in center of hay pile.

Inside of main duct, showing center outlet openings.





duct openings.

Dressed lumber for laterals, tongue-and-groove for main duct.

Be sure to close ends of laterals, and make sides tight.

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when building your hay drier

lating material such as tarpaper. If drier is built directly on an earth floor of hay barn, wooden bottoms should be built for ducts.

At least five feet of space should be allowed between ends of drier ducts and ends and sides of barn to prevent air from escaping and to force it upward through the hay.

Size of Drier

Overall size of drier varies with size of barn. The drier illustrated on these pages (13' wide by 30' long) was built from about 1,000 board feet of well-seasoned lumber. Green lumber will shrink and cause air to escape.

Width of Ducts

The important consideration in determining size of ducts and fan is the amount of air which should be circulated through ducts, and speed of cir-

culation. This will vary with size of barn. It is advisable, in estimating the size fan needed, to allow 10 cubic feet of air per minute, per square foot of haymow floor. If your barn floor, for example, is 30' by 50' (1,500 square feet in area), you need a fan that will blow 15,000 cubic feet of air a minute through ducts. Fans are rated by the amount of air they blow. Only a multi-vane fan will give required volume and pressure with minimum power.

The cross-sectional area of main duct should be such that air velocity does not exceed 1,400 feet per minute, inside main duct. Also, cross-section of main duct must always equal at least total cross-section area of lateral ducts served from any point. And cross-section area of lateral ducts should equal air escape area around bottom of ducts.

Duct Construction

Main and lateral ducts should be carefully built, permitting air to escape only at desired places. Tongue-and-groove lumber should be used on main duct, and lateral ducts should be built of dressed lumber.

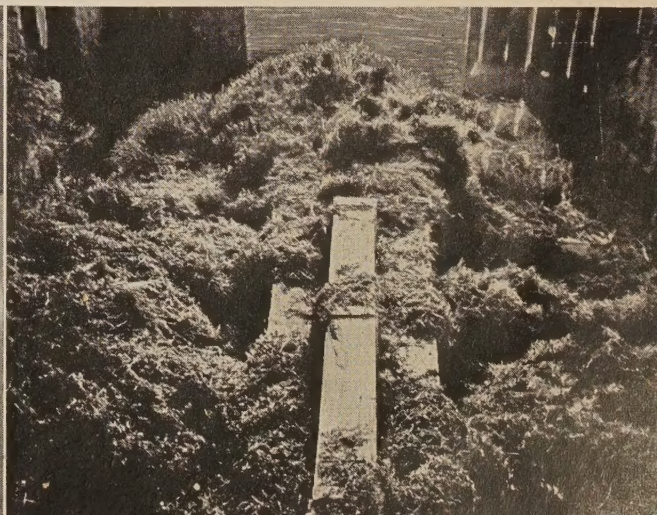
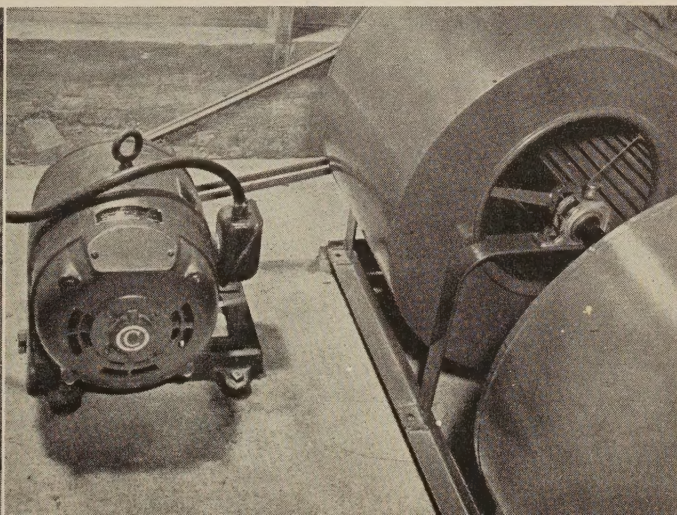
Lateral ducts may be spaced 5 feet apart, and should not extend closer than 5 feet to sides of barn. They should be securely fastened to main duct and to floor, to prevent movement when hay is dropped on them. Ends of all ducts are closed.

On top of main duct, escape ducts should be built (see photograph) where it is wider than three feet to prevent hay immediately over main duct from heating. Inside support should also be provided for top of main duct where it exceeds 3 feet in width.

center support and
gs.

Motor hooked to blower fans. A dust-tight housing
should cover these.

Hay partially covering the finished drier.



Handy Building Tips

Tarpaper on floor if not airtight. Wood duct bottom on dirt floors.

Allow 5' of space between ends of drier and barn walls.

Use seasoned lumber, not green, and without open knots.

Multiply the number of square feet in your barn or mow floor by 10 to get the number of cubic feet of air per minute your fan should deliver.

Divide this total—the cubic feet of air per minute—by 1,400 to arrive at the cross-section area of your main duct.

Total area of lateral ducts should equal that of main duct at any point.

Close the ends of all ducts.

Don't forget the escape ducts *on top* of the main duct where the latter is wider than 3 feet.

A dust-tight housing at least 6 feet wide, 8 feet long and 6 feet high should be provided for fans and motor. Tongue-and-groove lumber is necessary to keep dust away from the fan and motor and to prevent air in the hay from circulating by being sucked into the fan through cracks. Use "V" pulleys and "V" belts for short-coupled efficient drive from motor to fans. Keep fans and motor in good repair—tight and well-oiled.

These suggestions for making a hay drier are based very largely on plans for hay driers devised by the Tennessee Valley Authority, in cooperation with the University of Tennessee; by the Virginia Polytechnic Institute, and by other state agencies. Mechanical hay-drying is still in the experimental stage, and those planning to build a drier are advised to seek advice from local Extension Service representatives or other agencies or individuals who may have information on the subject. Size, shape, blower capacity and other essential details of the drier will vary considerably with the specific needs of the barn in which it is to be built and possibly the type of hay to be cured.

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